

CLAIMS

1. A projector comprising:
an ultrasonic speaker;
5 a visual information generation unit that generates visual information relating to a sound reproduction range of the ultrasonic speaker; and
an image projection unit that displays the visual information generated by the visual information generation unit on a screen.
- 10 2. A projector according to claim 1, wherein the visual information relating to the sound reproduction range and displayed on the screen includes at least one of sound reproduction range information, reproduction volume information, and direction information of sound reflected from the screen.
- 15 3. A projector according to claim 1 wherein the ultrasonic speaker comprises: a carrier wave oscillation source that generates a carrier wave signal in an ultrasonic frequency band; an audible frequency oscillation source that generates a signal in an audible
frequency band; a modulation section that generates a modulated signal by modulating
the carrier wave signal generated from the carrier wave oscillation source using the signal
20 in the audible frequency band from the audible frequency oscillation source; a power amplifier that amplifies the modulated signal; an ultrasonic transducer that converts the modulated signal amplified by the power amplifier into sound waves of a finite amplitude level and radiates the sound waves through a medium; a reproduction range setting section that sets a sound reproduction range, volume, and other predetermined
25 settings of the ultrasonic transducer and stores the setting information; and a reproduction

range control processing section that adjusts the signal of the audible frequency band generated using the carrier wave oscillation source based on the settings of the reproduction range setting section,

the projector further comprising:

5 a distance measuring section that measures the distance between the screen and the projector;

a visual information generation section that generates the visual information relating to the sound reproduction range based on the setting information set by the reproduction range setting section and on information of the distance between the screen
10 and the projector measured by the distance measuring section; and

an image projection section that projects visual information generated by the visual information generation section.

4. A projector according to claim 1, comprising:

15 a plurality of ultrasonic speakers; and

a unit that generates visual information relating to a sound reproduction range of each ultrasonic speaker and displays the visual information on the screen.

5. A method for displaying sound reproduction range in a projector equipped with an
20 ultrasonic speaker, the method comprising the steps of:

generating visual information relating to a sound reproduction range of the ultrasonic speaker; and

displaying the visual information generated in the step of generating visual information on a screen.

6. A method for displaying sound reproduction range in a projector, according to claim 5, wherein the visual information relating to the sound reproduction range and displayed on the screen includes at least one of sound reproduction range information, reproduction volume information, and direction information of sound reflected from the
5 screen.

7. A method for displaying sound reproduction range in a projector, according to claim 5, wherein the projector comprises a plurality of ultrasonic speakers,
the method comprising the steps of:
10 generating visual information relating to a sound reproduction range of each ultrasonic speaker; and
displaying the visual information on the screen.